AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): An optimum command producing apparatus ~~for inputting~~ configured to receive a command, ~~processing~~ process the command in such a manner that a ~~control~~ controlled object implements a desirable operation and ~~outputting~~ output an optimum command value to a servo control apparatus, the apparatus comprising:

an N-order filter processing section ~~for carrying~~ configured to carry out an N-order filter processing for the command and ~~calculating~~ calculate values from a ~~1-rank~~ 1-order differential value to an ~~(N-1) rank~~ (N-1)-order differential value of the command subjected to the filter processing, wherein N is an integer of 2 or more; and

an arithmetic unit ~~for adding~~ configured to calculate a value obtained by multiplying ~~an output of~~ each of the values calculated by the N-order filter processing section by a ~~gain~~ corresponding one of gains, and

wherein N is equal to or greater than a value defined by subtracting an order of the command from an order of denominator of a transfer function of an approximation model that represents the controlled object with Laplace operator.

2. (currently amended): An optimum command producing apparatus ~~for inputting~~ configured to receive a command, ~~processing~~ process the command in such a manner that a

~~control~~ controlled object implements a desirable operation and ~~outputting~~ output an optimum command value to a servo control apparatus, the apparatus comprising:

an N-order filter processing section ~~for carrying~~ configured to carry out an N-order filter processing for the command and calculating values from a ~~1-rank~~ 1-order differential value to an ~~(N-1)-rank~~ (N-1)-order differential value of the command subjected to the filter processing, wherein N is an integer of 2 or more;

an arithmetic unit ~~for adding~~ configured to calculate a value obtained by multiplying ~~an output of~~ each of the values calculated by the N-order filter processing section by a ~~gain,~~ corresponding one of gains; and

an M-order filter processing section ~~for carrying out~~ configured to perform an M-order filter processing ~~over respective variables output from~~ the value calculated by the arithmetic unit ~~again~~ wherein M is an integer of 1 or more,

wherein N is equal to or greater than a value defined by subtracting an order of the command from an order of denominator of a transfer function of an approximation model that represents the controlled object with Laplace operator.

3. (currently amended): An optimum command producing apparatus ~~for inputting~~ configured to receive a command, ~~processing~~ process the command in such a manner that a ~~control~~ controlled object implements a desirable operation and ~~outputting~~ output an optimum command value to a servo control apparatus, the apparatus comprising:

an N-order filter processing section ~~for carrying~~ configured to carry out an N-order filter processing for the command and ~~calculating~~ calculate values from a ~~1-rank~~ 1-order differential

value to an ~~L-rank~~ L-order differential value of the command subjected to the filter processing, wherein N is an integer of 2 or more and L is an integer of 1 or more; and

an arithmetic unit ~~for multiplying, by a gain,~~ configured to multiply each of the values ~~from the 1-rank differential to the L-rank differential to be outputs of~~ calculated by the N-order filter processing section ~~respectively~~ by a corresponding one of gains, and then ~~adding~~ sum all of ~~them up~~ the resulting products,

wherein L is an order of denominator of a transfer function of an approximation model that represents the controlled object with Laplace operator, and

wherein N is equal to or greater than a value defined by subtracting an order of the command from L.

4. (canceled)

5. (currently amended): The optimum command producing apparatus according to ~~claim 3~~ any one of claims 1 to 3, wherein a recursive type filter or a non-recursive type filter is used for the N-order filter ~~and an order N of the N-order filter is set to be an order or more which is necessary for converting the command to be L-rank differentiable~~.

6. (original): The optimum command producing apparatus according to claim 1, wherein the optimum command value is one of a position command, a speed command, an acceleration command and a torque command or a combination thereof.